

REMARKS

This paper is responsive to non-final Office action dated July 23, 2003. Claims 1, 3-16, 18-33, 35-62, 64-70, 72-74, 76-79, 81, 82, 84-88 and 90-100 are pending in the application.

By way of the present amendment, claims 93 and 99 are being amended to correct minor informalities.

Claims 1, 7-9, 20, 21-26, 39-41, 50, 52-55, 62, 66, 67, 69, 76-79, 84, 87, and 98-100 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Knowles (U.S. Pat. No. 5,329,070) in view of Kambara (U.S. Pat. No. 6,091,406) and further in view of Gill (U.S. Pat. No. 5,831,934).

Claims 3, 6, 35, 38, 51, 85, 93-95, and 97 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles and Kambara, in view of Colloms (WO 97/09847), and further in view of Gill.

Claims 4 and 36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Weigers (U.S. Pat. No. 5,856,820).

Claims 5 and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Zook (U.S. Pat. No. 6,246,638).

Claims 12-14, 44-46, and 58-59 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Takahashi (U.S. Pat. No. 5,638,093).

Claims 15 and 47 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Tager (U.S. Pat. No. 6,160,757).

Claims 16 and 48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Hoffberg (U.S. Pat. No. 6,400,996).

Claims 18 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Flowers (U.S. Pat. No. 6,160,757).

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Claims 19, 33, 49, and 60-61 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Kent (U.S. Pat. No. 5,986,224).

Claim 31 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Azima (WO 97/09857).

Claim 32 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, and Azima in view of Kent.

Claims 68, 70, 86, and 88 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Hotta (U.S. Pat. No. 4,389,711).

Claims 73-74, 91-92, 64-65, and 81-82 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Koh (U.S. Pat. No. 6,335,725).

Claims 72 and 90 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Ketwich (U.S. Pat. No. 6,072,475).

Claim 96 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, Colloms, in view of Romein (U.S. Pat. No. 4,246,439).

Claims 10-11, 42-43, 56-57 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, and Gill, in view of Hoffberg (U.S. Pat. No. 6,400,996).

Claims 27-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Knowles, Kambara, in view of Kinra (U.S. Pat. No. 5,305,239). While not specifically mentioned, applicant assumes that claims Gill is also being used in the rejection of these claims.

Applicant respectfully traverses the rejections above for the following reasons.

With regards to claim 1, the Office Action states that Knowles teaches a method of determining information relating to a passive contact sensitive device that includes the steps of contacting the member at a distance location to generate a wave vibration in the member, relying on Fig. 8, items t-tx, t-ty and the description at col. 9, lines 19-30. The Applicant respectfully disagrees with this interpretation of Knowles. Knowles discloses a touch position sensor that

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utilizes a shear wave that propagates in a substrate along a plurality of paths of differing lengths and differing positions. A touch on the substrate forms a perturbation whose time of occurrence is sensed to determine the position of the touch on the substrate. Col. 4, lines 24-30. Knowles teaches an active contact sensitive device in that the shear waves illustrated in Fig. 8 are generated by the transmitting transducers 18 and 22 to define the X and Y axis, respectively. See Col. 7, lines 52 to col. 8 line 12. The touch absorbs a portion of energy in the shear waves passing above or underneath the touched position. This partial absorption of energy creates a perturbation in the shear wave whose energy is absorbed, which is reflected in the amplitude of the signals generated by the transducers measuring the shear wave as shown in Fig. 8 and described in col. 9, lines 19-30.

The Office Action admits that Knowles does not teach generating bending wave vibrations and measuring the bending wave vibration to determine a measured bending wave signal as claimed. The Office action relies on Kambara to teach bulk waves propagated through the substrate.

Kambara teaches an acoustic wave transducer that generates a bulk wave in a substrate of an acoustic touch sensing device, which then interact with a grating structure to produce a useful plate wave or surface-bound wave such as a Rayleigh wave, Love wave or HOHPS wave. Col. 6, lines 37-46. Kambara further teaches that the bulk wave modes themselves are typically unsuitable for use in touchscreens and must be converted to a more useful wave modes. Col. 6, lines 48-50. Kambara further teaches that the surface bound or plate waves may then be employed to detect a touch position. Col. 7, lines 11-16. Further, claim 1 requires the bending wave vibration to be caused by contacting the member at a discrete location and requires that that bending wave vibration be measured. Applicant also notes with respect to claim 1 that Kambara and Knowles both teach an active contact sensitive device. Knowles does not teach bending waves, as admitted by the Examiner, and Kambara teaches that the surface bound or plate waves are used to detect a touch position. Thus, neither Kambara nor Knowles, alone or in combination, teach measuring the bending wave vibration in the member generated by contacting the member to determine a measured bending wave signal as recited in claim 1.

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The Office Action admits that neither Kambara nor Knowles teaches applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source. The Office Action asserts that Gill teaches applying a correction to convert the measured bending wave signal to a propagation signal by fitting the data to a mathematical model of dispersion, citing col. 27, lines 58-63. The Office Action also asserts that it would be obvious to one of ordinary skill to use the approach taught in Gill, in the Knowles and Kambara apparatus and method in order to provide improved measurement.

For the reasons given below, the applicant respectfully submits that there is no motivation to combine Gill with Kambara and Knowles and that even if combined, Gill, alone or in combination with Knowles and Kambara fails to teach applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source.

Gill describes a method for analyzing received wave signal data in an acoustic logging system. The purpose of Gill is to determine the phase velocity in the surrounding geophysical formation. The acoustic transmitters in Gill generate acoustic waves that include compression waves, shear waves, and undesirable tube waves. Col. 6, lines 32-34. The measured signal is filtered into a frequency band, such that the filtered signals result in a wavepacket using a Heisenberg filter. A Hilbert transform is used to generate both real and imaginary components of the wavepackets, which is useful for calculation of phase as a function of time. The method then calculates phase at multiple points for the wave packet. That information is used to estimate the time delay between different measurements of phase rather than one threshold measurement of time or arrival. The time of arrival estimation is then used to determine phase velocity, from which useful information is obtained about the surrounding geophysical medium.

Gill teaches that "the multiplicity of phase arrival data may be corrected for dispersion effects in the formation, for example by fitting the data to a mathematical model of dispersion, thereby providing improved measurements of true acoustic phase velocity." Col. 27, lines 58-63.

Applicant submits there is no motivation to combine Gill with Kambara and Knowles because neither measures the bending wave signals as recited in claim 1 and thus neither requires nor can utilize the correction recited in claim 1. As explained above, Knowles teaches measuring shear waves and Kambara teaches that the bulk wave modes themselves are typically

unsuitable for use in touchscreens and must be converted to a more useful wave modes such as the surface bound or plate waves, which are then employed to detect a touch position. Thus, there is no need for dispersion correction. Further, Gill teaches determining time of flight over a narrow frequency band in order to obtain phase velocity of a structure, not the location of disturbances. Thus, even if Gill did teach the dispersion correction as recited in claim 1 (which the Applicant disputes), there is no motivation to combine Gill with Kambara and Knowles. Further, because there is no need for dispersion correction in Knowles and Kambara, the Office Action fails to show how combining Gill with Kambara and Knowles achieves the invention recited in claim 1.

Applicant also respectfully submits that Gill fails to teach applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source. The measured bending wave in claim 1 is the bending wave vibration generated by contacting the member at the discrete location. Gill fails to teach using the bending waves at all as required by claim 1. Instead Gill teaches using compression waves, shear waves, and undesirable tube waves that are generated by acoustic transmitters, not by contacting the member. Thus, Gill cannot teach applying a correction factor to convert the measured bending wave signal. Further, all Gill teaches about dispersion is that the multiplicity of phase arrival data may be corrected for dispersion effects in the formation, for example by fitting the data to a mathematical model of dispersion. That fails to teach converting the measured bending wave signal to a propagation signal from a non-dispersive wave source by applying a correction. Thus, applicant respectfully submits that Gill fails to teach applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source

In view of the above remarks, applicant submits that claim 1 and all claims dependent thereon distinguish over the references of record.

With regards to claim 22, applicant respectfully submits that Knowles does not teach bending waves, as admitted by the Examiner, and Kambara teaches that the surface bound or plate waves are used to detect a touch position. Thus, neither Kambara nor Knowles, alone or in combination, teach measuring the changed bending wave vibration in the member to determine a measured bending wave signal as recited in claim 22.

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The Office Action admits that neither Kambara nor Knowles teaches applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source. The Office Action asserts that Gill teaches applying a correction to convert the measured bending wave signal to a propagation signal by fitting the data to a mathematical model of dispersion, citing col. 27, lines 58-63. The Office Action also asserts that it would be obvious to one of ordinary skill to use the approach taught in Gill, in the Knowles and Kambara apparatus and method in order to provide improved measurement.

For the reasons given above, the applicant respectfully submits that there is no motivation to combine Gill with Kambara and Knowles and that even if combined, Gill, alone or in combination with Knowles and Kambara fails to teach applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source.

Applicant submits there is no motivation to combine Gill with Kambara and Knowles because neither measures the bending wave signals as recited in claim 22 and thus neither requires, nor can utilize, the correction recited in claim 22 to correct for dispersion. As explained above, Knowles teaches measuring shear waves and Kambara teaches that the bulk wave modes themselves are typically unsuitable for use in touchscreens and must be converted to a more useful wave modes such as the surface bound or plate waves, which are then employed to detect a touch position. Thus, there is no need for dispersion correction. Thus, even if Gill did teach the dispersion correction as recited in claim 1 (which the Applicant disputes), there is no motivation to combine Gill with Kambara and Knowles. Further, because there is no need for dispersion correction in Knowles and Kambara, the Office Action fails to show how combining Gill with Kambara and Knowles achieves the invention recited in claim 22.

Applicant also respectfully submits that Gill fails to teach applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source. The measured bending wave in claim 22 is the changed bending wave caused by contacting the member at the discrete location to produce a change in a generated bending wave vibration. Gill fails to teach correcting a measured changed bending wave, which was changed by contacting the member. Gill therefore fails to teach applying a correction factor to the measured bending waves as required by claim 22. Instead Gill teaches generating compression

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waves, shear waves, and undesirable tube waves using acoustic transmitters. Thus, Gill cannot teach applying a correction factor to convert the measured bending wave signal as the Office Action asserts. Further, all Gill teaches about dispersion is that the multiplicity of phase arrival data may be corrected for dispersion effects in the formation, for example by fitting the data to a mathematical model of dispersion. That fails to teach converting the measured bending wave signal to a propagation signal from a non-dispersive wave source by applying a correction.

In view of the above remarks, applicant submits that claim 22 and all claims dependent thereon distinguish over the references of record.

With regards to claim 52, applicant respectfully submits that claim 52 and all claims dependent thereon distinguish over the references of record for at least the reasons recited with relation to claim 22.

With regards to claim 62, the Office Action admits that Knowles does not show bending wave vibration and relies on Kambara to teach "bulk waves propagated through the substrate."

Kambara teaches an acoustic wave transducer that generates a bulk wave in a substrate of an acoustic touch sensing device, which then interact with a grating structure to produce a useful plate wave or surface-bound wave such as a Rayleigh wave, Love wave or HOHPS wave. Col. 6, lines 37-46. Kambara further teaches that the bulk wave modes themselves are typically unsuitable for use in touchscreens and must be converted to a more useful wave modes. Col. 6, lines 48-50. Kambara further teaches that the surface bound or plate waves may then be employed to detect a touch position. Col. 7, lines 11-16. Thus, neither Kambara, nor Knowles, alone or in combination, show a sensor coupled to the member for measuring bending wave vibration in the member.

The Office Action admits that neither Kambara nor Knowles teaches applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source. The Office Action asserts that Gill teaches applying a correction to convert the measured bending wave signal to a propagation signal by fitting the data to a mathematical model of dispersion, citing col. 27, lines 58-63. The Office Action also asserts that

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it would be obvious to one of ordinary skill to use the approach taught in Gill, in the Knowles and Kambara apparatus and method in order to provide improved measurement.

For the reasons given below, the applicant respectfully submits that there is no motivation to combine Gill with Kambara and Knowles and that even if combined, Gill, alone or in combination with Knowles and Kambara, fails to teach applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source.

Applicant submits there is no motivation to combine Gill with Kambara and Knowles because neither measures the bending wave signals as recited in claim 62 and thus neither requires nor can utilize the correction recited in claim 62. As explained above, Knowles teaches measuring shear waves and Kambara teaches that the bulk wave modes themselves are typically unsuitable for use in touchscreens and must be converted to a more useful wave modes such as the surface bound or plate waves, which are then employed to detect a touch position. Thus, there is no need for dispersion correction. Thus, even if Gill did teach the dispersion correction as recited in claim 62 (which the Applicant disputes), there is no motivation to combine Gill with Kambara and Knowles. Further, because there is no need for dispersion correction in Knowles and Kambara, the Office Action fails to show how combining Gill with Kambara and Knowles achieves the invention recited in claim 62.

Applicant also respectfully submits that Gill fails to teach applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source. Gill fails to teach the bending wave vibration in the member created by the contact and measured by at least one sensor as required by claim 62. Instead Gill teaches using compression waves, shear waves, and undesirable tube waves that are generated by acoustic transmitters, not created by contacting the member. Thus, Gill cannot teach applying a correction factor to convert the measured bending wave signal. Further, all Gill teaches about dispersion is that the multiplicity of phase arrival data may be corrected for dispersion effects in the formation, for example by fitting the data to a mathematical model of dispersion. That fails to teach converting the measured bending wave signal to a propagation signal from a non-dispersive wave source by applying a correction.

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In view of the above remarks, applicant submits that claim 62 and all claims dependent thereon distinguish over the references of record.

With regards to claim 93 the Office Action admits that Knowles, Kambara and Colloms do not teach applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source. The Office Action asserts that it would be obvious to use the teaching of Gill. For at least the reasons given for claim 22 applicant respectfully submits that there is no motivation to combine Gill with Kambara, Knowles and that even if combined, Gill, alone or in combination with Knowles and Kambara fails to teach applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source. Colloms fails to make up for the deficiencies in Knowles Kambara and Gill with regard to applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source

In view of the above remarks, applicant submits that claim 93 and all claims dependent thereon distinguish over the references of record.

With regards to claim 98 the Office Action admits that Knowles and Kambara do not teach applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source. The Office Action asserts that it would be obvious to use the teaching of Gill. For at least the reasons given for claim 22 applicant respectfully submits that there is no motivation to combine Gill with Kambara and Knowles and that even if combined, Gill, alone or in combination with Knowles and Kambara fails to teach applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source. Colloms fails to make up for the deficiencies in Knowles Kambara and Gill with regard to applying a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source

In view of the above remarks, applicant submits that claim 98 distinguishes over the references of record.

With regards to claim 99, the Office Action states relies on Knowles to teach "contacting the member at a distance location to generate bending wave vibration in the member" relying on

Fig 8, items t-tx, t-ty and the description at col. 9, lines 19-30. The Office Action admits with regards to other claims that Knowles fails to teach bending wave vibration. Nowhere does Knowles teach contacting to generate bending wave vibration in the member by frictional movement of the contact as recited in claim 99. The Office Action admits that Knowles does not teach generating bending wave vibrations and measuring the bending wave vibration to determine a measured bending wave signal as claimed. The Office action relies on Kambara to teach bulk waves propagated through the substrate. However, as pointed out above, Kambara teaches that the surface bound or plate waves are used to detect a touch position. Thus, neither Kambara nor Knowles, alone or in combination, teach measuring the bending wave vibration in the member to determine a measured bending wave signal as recited in claim 99. Accordingly, applicant respectfully submits that claims 99 and 100 distinguish over Knowles and Kambara, alone or in combination with Gill.

In view of the above remarks, all claims are believed to be allowable over the art of record, and a Notice of Allowance to that effect is respectfully solicited. Nonetheless, if any issues remain that could be more efficiently handled by telephone, the Examiner is requested to call the undersigned at the number listed below.

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